



Bark Beetle Pheromones

Verbenone and MCH (methylcyclohexenone)



PHEROMONES ARE CONSIDERED PESTICIDES.

Although they do not kill bark beetles, pheromones are classified as pesticides. Montana law requires a valid pesticide applicator/dealer license to sell or charge to apply pheromones. If applying pheromones on your own property, you do not need a license to purchase or apply. Follow the pesticide label and use proper personal protective equipment!

PHEROMONE DISTRIBUTORS

- [Synergy Semiochemicals](#)
604-454-1122
- [Dillon Distributors](#)
406-239-5485
- [Swan Valley Connections \(group purchase\)](#)
406-754-3137
- [Forestry Distributing](#)
303-747-6414

Bark Beetle Chemical Ecology

Chemical ecology is the study of how organisms interact with their environment and each other using chemical signals. Bark beetles and their host trees have a complex evolutionary relationship, which includes unique chemical signaling.

Pheromones are chemical signals bark beetles use to communicate with one another. When a suitable host is found, they produce **aggregation pheromones** to attract more beetles to the area. Strength in numbers allows beetles to overwhelm host tree defenses when they attack *en masse*. When the host tree is full, bark beetles will produce **anti-aggregation pheromones**, which act as repellants to prevent overcrowding.

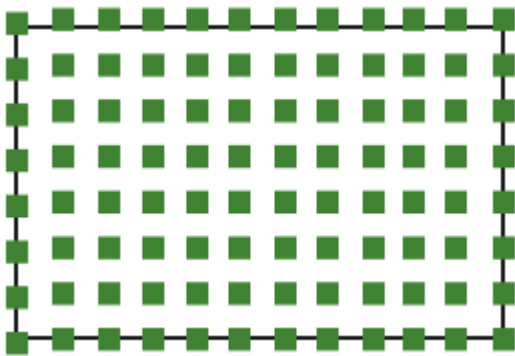
Research into bark beetle chemical ecology has advanced management techniques through use of synthesized pheromones. Aggregation pheromones can be used to lure and trap beetles, but this technique risks spillover into healthy trees. Anti-aggregation pheromones are more commonly used by landowners to prevent infestations on their property.

Using Pheromones

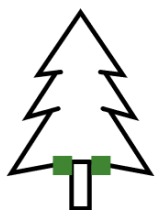
- Pheromones are species-specific. Accurately identify which bark beetles are active in your stand before ordering.
- Pheromones **will not** protect trees that have already been attacked. Pheromones must be hung before the bark beetle flight period begins to be effective; timing varies by species.
 - Order pheromones so they arrive in time to hang.
- Pheromones may be hung on to protect individual trees, or in a grid pattern to protect larger area.
- Do not pop the pheromone bubble capsule when hanging.
- Pheromones last one season and must be replaced each year that protection is desired.

Bark Beetle Pheromones

Anti-Aggregation Pheromone	Verbenone	MCH (methylcyclohexenone)
Bark Beetle	Mountain pine beetle (MPB)	Douglas-fir beetle (DFB)
Host Trees	Pines	Douglas-fir
Gallery Pattern	Long and straight with larval galleries on opposite sides, "crook" or J-shape at bottom	Long and straight with larval galleries on alternating sides
When to Hang	MPB flight begins mid-summer, once overwintering larvae have completed development to adulthood. Hang between 6/15-7/1.	DFB flight begins when temperatures are consistently reaching 60 degrees Fahrenheit (mid-spring in Montana). Hang MCH by 4/15.



Grid protection diagram



Individual tree protection



MPB gallery



DFB galleries